REMARKS

Favorable reconsideration of this application is requested in view of the foregoing amendments and the following remarks. Claims 9-13 and 17-38 are pending in the application. Claims 29-38 are newly presented. Claims 1-8 and 14-16 are canceled without prejudice or disclaimer.

The claims are amended in order to more clearly define the invention, support for which is found in the figures and related parts of the specification. Specifically, support for the phrase "instead of from vapor" is found at lines 3 and 13, page 10 of the application as originally filed. Support for "depositing" the condensed phase matrix is found in the first full paragraph of page 21 of the application as originally filed. The amendment to claim 22 simply deletes redundant phraseology and is not a limiting amendment. Support for the amendment to claim 28 (spectroscopic) is found in the second full paragraph of page 9. Support for new claims 29 and 34 (random distribution of intersection angles) is found in the last paragraph of page 30 and in FIG. 23 of this application as originally filed. Support for new claims 30 and 35 (interwoven) is found in claim 6 as originally filed. Support for new claims 31 and 37 (solid-state conversion and growth) is found in the paragraph bridging pages 9-10 of this application as originally filed. Support for new claims 32 and 38 (first deposit then second convert and grow) is found on pages 10 and 12 of this application as originally filed. Support for new claims 33 and 36 (subsequent annealing) is found in the first full paragraph of page 29 of this application as originally filed.

The title is amended to more concisely name the claimed invention. The abstract is amended to more accurately summarize the claimed invention.

Claims 9-11, 13 and 16-28 stand rejected under 35 USC 102(b) as anticipated by Smalley et al, WO 98/39250 (hereinafter Smalley).

All of the presently pending independent claims explicitly require that the plurality of nanostructures be **produced by condensed phase conversion and growth from the condensed phase matrix material instead of from vapor**. As noted above, support for the phrase "instead of from vapor" is found at lines 3 and 13, page 10 of the application as originally filed. Condensed phase means solid or liquid. The independent claims are amended to make explicit what was previously implied (i.e., the point of novelty is conversion and growth from a condensed phase (solid or liquid); and not from a gas or vapor.

In contrast to the presently claimed invention, every embodiment of Smalley involves a gas phase (vapor) between Smalley's target and the Smalley nanotubes and direct growth from the vapor by chemical vapor deposition of nanotubes. Moreover, Smalley explicitly teaches away from ablation and, therefore, away from (even residual) condensed phase(s). Please see Smalley at lines 14-16, page 21.

In more detail, Smalley describes methods involving (a) a supply of (b) vapor, which is (c) transported the "live end" of a carbon nanotube (the end containing a metal catalyst particle). All the Smalley methods include direct growth from the vapor by chemical vapor deposition of nanotubes. In Smalley's description of the laser vaporization process, the purpose of the laser is to supply "carbon vapor" (p.11, line 13 to p.12, line 4, the term "vapor" is repeated twice) to the live-end of the growing nanotube. On p.15, line 5 of Smalley the ideal vapor constituent is defined as having "less than ten carbon atoms per molecule". Once growth is started, many kinds of carbon-containing vapor molecules can be delivered "by the sweep gas" (see Smalley p.19 last paragraph, and Claims 57-59). These include all kinds of "hydrocarbon gasses" (Smalley p.19, line 28) such as methane, ethane, ..., and basically any kind of carbon-containing vapor-phase material Smalley could recite – anything which could be transported in the vapor phase to a "live end" of a growing nanotube. To Smalley, laser-vaporization and chemical vapor

deposition are the same. Both (in his mind) involved supplies of "vapors" of carbon or carbon-containing hydrocarbons which were gas-phase, transported to the catalyst nanoparticles.

The invention is not disclosed or suggested by Smalley because Smalley does not disclose or suggest condensed phase conversion and growth from a condensed phase matrix material instead of from vapor. Further, Smalley actually teaches away from the invention because Smalley explicitly teaches away from ablation and, therefore, away from condensed phase conversion and growth.

Accordingly, withdrawal of this rejection is respectfully requested.

Claim 12 stands rejected under 35 USC 103 as obvious over Smalley.

The invention defined by claim 12 is not disclosed or suggested by Smalley because the Smalley reference does not describe or teach a condensed phase matrix that undergoes condensed phase conversion and growth. As explained above, every embodiment of Smalley uses a laser vaporized gas. Smalley teaches away from any condensed phase conversion and growth. There is no logical reason why one of ordinary skill in the art who know of the Smalley disclosure would experiment with what does not exist in Smalley.

With regard to claims 29 and 34, these dependent claims add specific limitations that are not disclosed or suggest by the Smalley reference. Specifically, claims 29 and 34 explicitly require that the nanorods are interrelated to define a substantially random distribution of intersection angles. The loops of Smalley are piled on top of one another and are, therefore, substantially parallel to one another in at least one of three dimension and NOT randomly distributed.

With regard to claims 30 and 35, these dependent claims add specific limitations that are not disclosed or suggested by the Smalley reference. Specifically, claims 30 and 35 explicitly

require that the nanorods are interwoven. The loops of Smalley are merely piled on top of one another and are, therefore, not interwoven.

With regard to claims 31 and 37, these dependent claims add specific limitations that are not disclosed or suggested by the Smalley reference. Specifically, claims 31 and 37 explicitly require solid-state conversion and growth which is more specific than the more generic condensed phase conversion and growth of independent claims 9 and 12. As noted above, every embodiment of Smalley is vapor or gas based and Smalley teaches away from ablation, and therefore, from condensed phase (i.e., solid-state) conversion.

With regard to claims 32 and 38, these dependent claims add specific limitations that are not disclosed or suggested by the Smalley reference. Specifically, claims 32 and 38 explicitly require that activating take place after depositing. In these embodiments, the invention deposits the matrix material and then converts and grows the matrix into a plurality of nanorods by condensed phase conversion growth. The immediate nanofiber precursor of Smalley is his vapor and it is always disclosed by Smalley to be simultaneously supplied during nanofiber growth.

With regard to claims 33 and 36, these dependent claims add specific limitations that are not disclosed or suggested by the Smalley reference. Specifically, claims 33 and 36 explicitly require placing the composition in contact with condensed phase feedstock material and annealing to continue growth of the plurality of nanorods. The positively recited method step of annealing enables the re-initiation of condensed phase conversion and growth to form longer and/or additional nanotubes. This is an important and unexpected advantageous aspect of the invention not even hinted at by Smalley.

Thus, the above separately argued dependent claims sets are each considered to be separately patentable.

Accordingly, withdrawal of this rejection is respectfully requested.

The applicant filed an information disclosure statement (IDS) in the present application on September 26, 2002. The Applicant notes that (although the attachment 3 checkbox indicates that at least on PTO-1449 is of record), the Office Action was not accompanied by a copy of the listing of references (form PTO-1449) submitted with this IDS, initialed by the Examiner to indicate that the references cited therein were considered. The Applicant therefore requests that the Examiner consider the references cited in this IDS and forward a copy of the initialed PTO-1449 to the Applicant.

Other than as explicitly set forth above, this reply does not include acquiescence to statements by the Examiner. In view of the above, all the claims are considered patentable and allowance of all the claims is respectfully requested. The Examiner is invited to telephone the undersigned (at direct line 512-457-7233) for prompt action in the event any issues remain.

No fee is due for filing this Reply because it is being filed within the shortened statutory period for response as set in the Office Action dated October 3, 2003.

The Commissioner is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 50-0456 of Gray Cary Ware & Freidenrich, LLP.

Respectfully submitted,

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